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FOREST AREA AND TIMBER RESOURCE STATISTICS FOR THE BEAR RIVER AND WASATCH FRONT WORKING CIRCLES, UTAH, 1976-1977

DOROTHY G. FELT



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FOREST AREA AND TIMBER RESOURCE STATISTICS
FOR THE
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UTAH, 1976-1977

DOROTHY G. FELT

INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION
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Ogden, Utah 84401

RESEARCH SUMMARY

Presents land area, commercial timberland area, timber inventory, and growth and mortality data based on Resources Evaluation standards.

CONTENTS

	Page
INTRODUCTION	1
HIGHLIGHTS	4
Area	4
Inventory	4
Growth and Mortality	5
HOW THE INVENTORY WAS CONDUCTED	5
DATA RELIABILITY	5
TERMINOLOGY AND DATA TABLES	6
TERMINOLOGY	6
Land	6
Water	7
Land Use Classes	7
Public Ownership Classes	7
Private Ownership Classes	7
Forest Type and Tree Species	8
Area Condition Classes	8
Class of Timber	9
Tree Size Classes	9
Volume	10
Growth and Mortality	10
Site	10
Stand-Size Classes	10
FIGURES	
1. Bear River and Wasatch Front Working Circles, Utah	2
2. Total land area for the Bear River and Wasatch Front Working Circles, by ownership	3
3. Total land area for the Bear River and Wasatch Front Working Circles, by land class	3
4. Total area of forest land for the Bear River and Wasatch Front Working Circles, by ownership	3
5. Area of productive timberland for the Bear River and Wasatch Front Working Circles, by ownership	3
6. Area of commercial timberland for the Bear River and Wasatch Front Working Circles, by ownership (excluding National Forest)	4

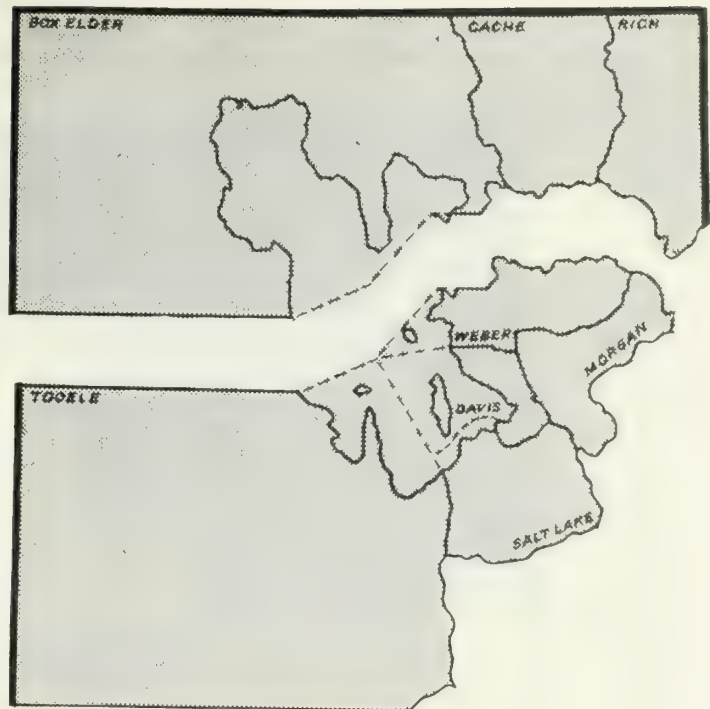
FOREST SURVEY TABLES

1. Area of forest land and percent standard error for the Bear River and Wasatch Front Working Circles, 1977	6
2. Net volume and net annual growth and annual mortality of growing stock and sawtimber on commercial timberland, with percent standard error for the Bear River and Wasatch Front Working Circles, 1977	6
3. Total land and water area in the Bear River and Wasatch Front Working Circles by ownership class, 1977	11
4. Total land area in the Bear River and Wasatch Front Working Circles by major land class and ownership class, 1977	11
5. Area of commercial timberland in the Bear River and Wasatch Front Working Circles by forest type, stand-size class, and site class, 1977	12
6. Area of publicly owned commercial timberland in the Bear River and Wasatch Front Working Circles by forest type, stand-size class, and site class, 1977	13
7. Area of privately owned commercial timberland in the Bear River and Wasatch Front Working Circles by forest type, stand-size class, and site class, 1977	14
8. Area of commercial timberland in the Bear River and Wasatch Front Working Circles by stand volume and ownership class, 1977	15
9. Area of commercial timberland in the Bear River and Wasatch Front Working Circles by forest type and area condition class, 1977	15
10. Area of productive reserved and other forest land in the Bear River and Wasatch Front Working Circles by land class, ownership class, and forest type, 1977	16
11. Number of growing stock trees on commercial timberland in the Bear River and Wasatch Front Working Circles by species and diameter class, 1977	16
12. Number of cull and salvable dead trees on commercial timberland in the Bear River and Wasatch Front Working Circles by ownership class, and softwoods and hardwoods, 1977	17
13. Net volume of growing stock on commercial timberland in the Bear River and Wasatch Front Working Circles by ownership class, forest type, and stand-size class, 1977	18
14. Net volume of sawtimber on commercial timberland in the Bear River and Wasatch Front Working Circles by ownership class, forest type, and stand-size class, 1977	19

	Page
15. Net volume of growing stock on commercial timberland in the Bear River and Wasatch Front Working Circles by species and diameter class, 1977	20
16. Net volume of sawtimber on commercial timberland in the Bear River and Wasatch Front Working Circles by species and diameter class, 1977	20
17. Net volume of growing stock and sawtimber on commercial timberland in the Bear River and Wasatch Front Working Circles by ownership class and species, 1977	21
18. Net volume of timber on commercial timberland in the Bear River and Wasatch Front Working Circles by class of timber, and softwoods and hardwoods, 1977	22
19. Net volume of growing stock on commercial timberland in the Bear River and Wasatch Front Working Circles by forest type and species, 1977	22
20. Net volume of sawtimber on commercial timberland in the Bear River and Wasatch Front Working Circles by forest type and species, 1977	23
21. Net annual growth of growing stock and sawtimber on commercial timberland in the Bear River and Wasatch Front Working Circles by ownership class and species, 1977	23
22. Annual mortality of growing stock and sawtimber on commercial timberland in the Bear River and Wasatch Front Working Circles by ownership class, and softwoods and hardwoods, 1977	24
23. Annual mortality of growing stock and sawtimber on commercial timberland in the Bear River and Wasatch Front Working Circles by cause of death and species, 1977	25

BEAR RIVER AND

WASATCH FRONT



INTRODUCTION

This resource bulletin presents the principal findings of the second forest inventory of public and private lands, excluding National Forest ownership, in the eight county area making up the Bear River and Wasatch Front Working Circles (fig. 1; additional information for ownership by land classes is presented in figures 2-5). Fieldwork began in September 1976 and was completed in November 1977. This bulletin does not note changes and trends since the statewide inventory of 1961, nor does it contain estimates of timber removals. These items will be included in the State Analytical Report to be published in the near future.

The primary objective of Resources Evaluation, a continuing nationwide undertaking conducted by the USDA Forest Service, is to provide an assessment of the renewable resource situation on the Nation's forests and rangelands. Fundamental to the accomplishment of this objective are the periodic state-by-state resource inventories. Originally, Resources Evaluation--formerly Forest Survey--was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

The resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, Wyoming, and western South Dakota are administered by the Intermountain Forest and Range Experiment Station, with headquarters in Ogden, Utah. These inventories provide information on the extent and condition of publicly and privately owned forest lands, volume of timber, and rates of timber growth and mortality. These data, when combined with similar information on Federal lands, provide a basis for the formulation of forest policies and programs and for the orderly development and use of the resources.

UTAH

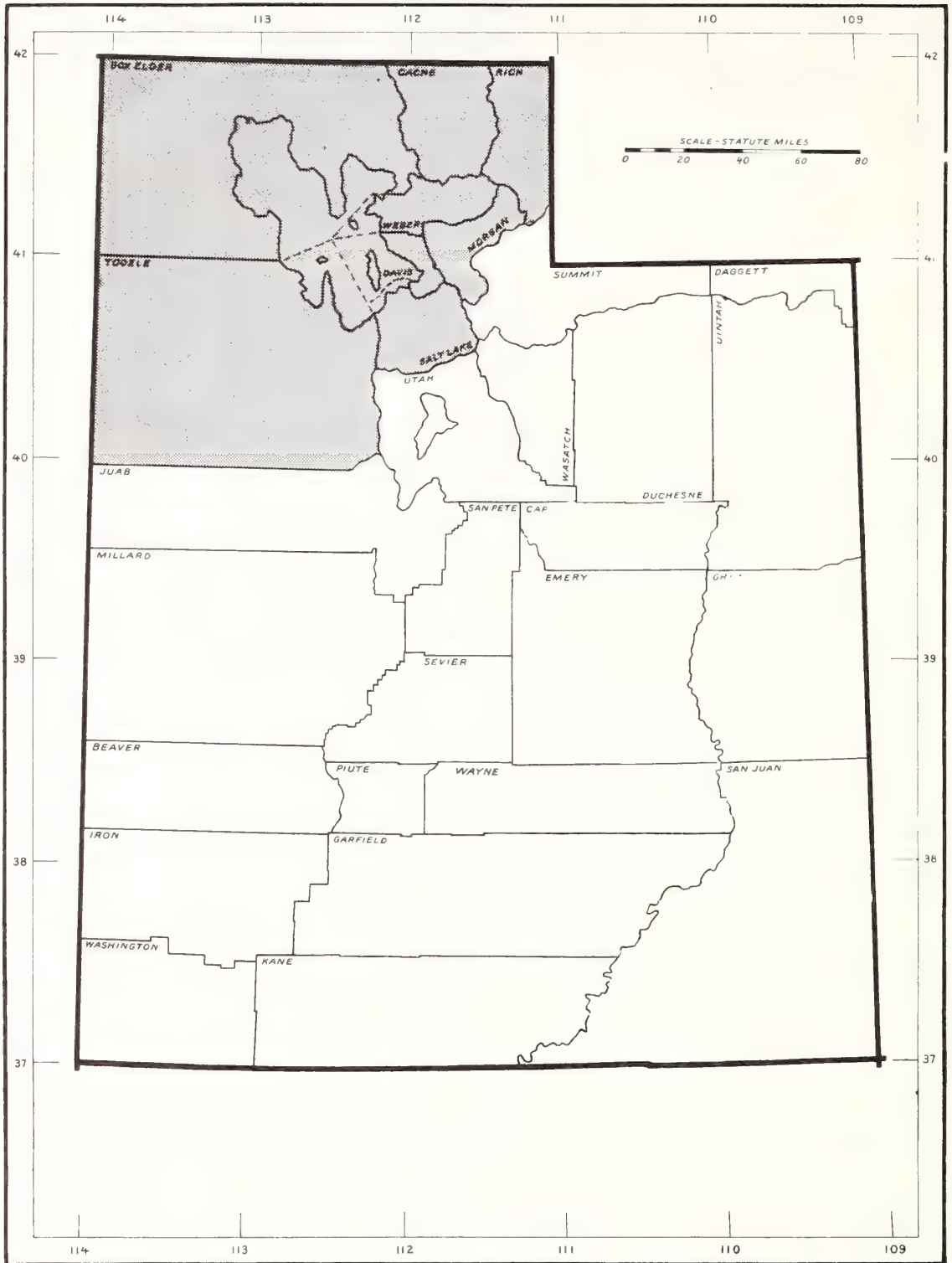


Figure 1.--Bear River and Wasatch Front Working Circles, Utah.

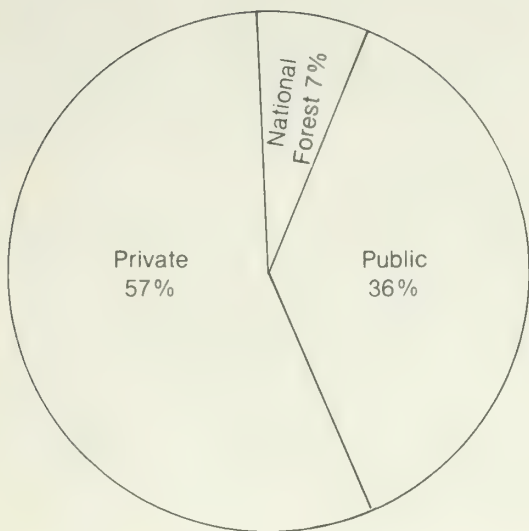


Figure 2.--Total land area for the Bear River and Wasatch Front Working Circles, by ownership.

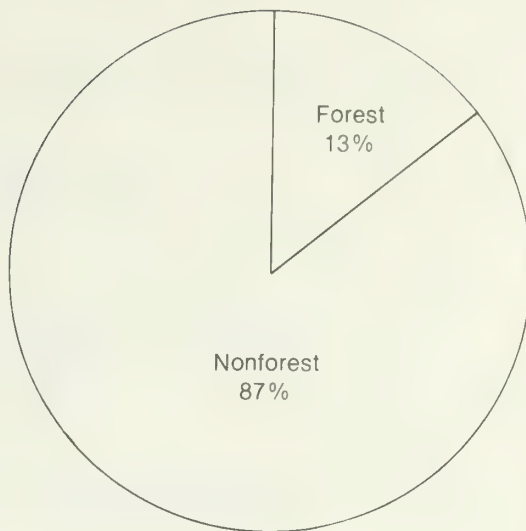


Figure 3.--Total land area for the Bear River and Wasatch Front Working Circles, by land class.

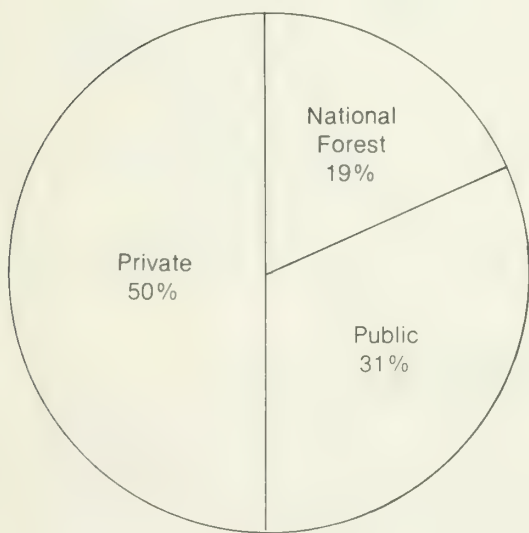


Figure 4.--Total area of forest land for the Bear River and Wasatch Front Working Circles, by ownership.

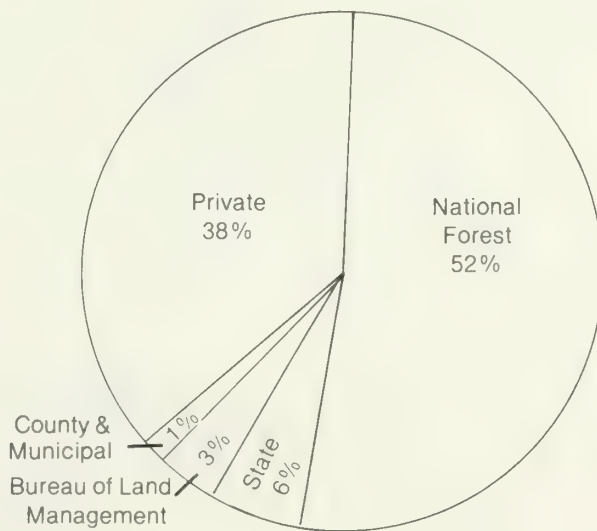


Figure 5.--Area of productive timberland for the Bear River and Wasatch Front Working Circles, by ownership.

HIGHLIGHTS

Area

- Forests occupy 1,162 thousand acres (470 thousand hectares), or 12 percent of the total public and private land area in the working circles.

- Of the forest land, 159 thousand acres (64 thousand hectares), almost 14 percent, is classified as commercial timberland.

- Private ownership accounts for 126 thousand acres (51 thousand hectares), nearly four-fifths of the commercial timberland (fig. 6).

- Fir-spruce, Douglas-fir, and aspen are the predominant forest types and occupy 95 percent of the commercial timberland. Lodgepole pine and cottonwood forest types cover the remaining area.

- Forest land, with the potential to produce from 50 to 84 cubic feet per acre per year, accounts for more than half of the commercial timberland, and nearly 80 percent of such land is privately owned.

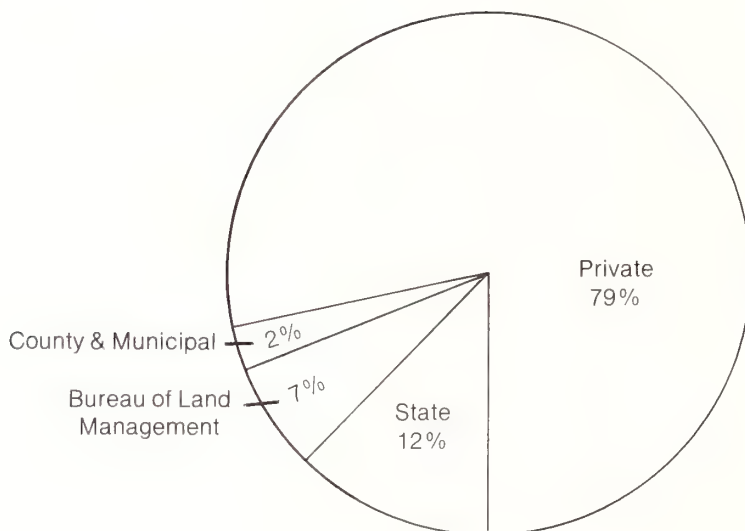


Figure 6.--Area of commercial timberland for the Bear River and Wasatch Front Working Circles, by ownership (excluding National Forest).

Inventory

- Growing stock volume amounts to 201 million cubic feet (5.7 million cubic meters) and sawtimber volume totals 656 million board feet.¹

- Rough, rotten, and salvable dead trees comprise 14 million cubic feet (405 thousand cubic meters), 7 percent of the total timber volume.

¹International 1/4-inch rule.

- The largest share of the total growing stock volume is made up of Douglas-fir (34 percent) and subalpine fir (27 percent). White fir, Engelmann spruce, limber pine, lodgepole pine, pinyon/juniper,² aspen, and cottonwood account for the remaining volume.

- Private owners control 77 percent of both the total growing stock and the sawtimber volume.

Growth and Mortality

- Net annual growth totals 4,076 thousand cubic feet (115 thousand cubic meters). Growth and mortality were not measured for pinyon and juniper trees.

- Seventy-eight percent of the total net growth is on private lands.

- The annual mortality of 1,540 thousand cubic feet (44 thousand cubic meters) offsets 27 percent of the gross annual growth.

HOW THE INVENTORY WAS CONDUCTED

The inventory was designed to provide reliable statistics primarily at the state and working circle levels. Procedures were as follows:

1. Initial area estimates were based on the classification of 40,400 sample points systematically placed on the latest aerial photographs available. The sample points were summarized and grouped into strata for subsequent field sampling. The photo points, adjusted to meet known land areas, were used to compute area expansion factors for the field stratum means.

2. Land classification and estimates of timber characteristics and volume were based on observations and measurements recorded at 117 ground sample locations. Sample trees were selected using a 10-point cluster which includes fixed plots (1/300 acre) for trees less than 5.0 inches d.b.h. and variable plots (40 BAF) for trees 5.0 inches d.b.h. or larger.

3. For most species, volume and defect were computed using equations developed for the Ashley National Forest. For other species, Kemp's equations were used.

4. All photo and field data were sent to Ogden, Utah, for editing and were punched onto cards and stored for machine computing, sorting, and tabulation. Final estimates were based on statistical summaries of the data.

DATA RELIABILITY

Individual cells within tables should be used with caution. Some are based on very small sample sizes and so result in high sampling errors. The standard error percents shown in tables 1 and 2 were calculated at the 67 percent confidence level.

²Although pinyon/juniper usually occurs on unproductive forest land, when it occurs in mixtures with other species on productive sites, it is reported in the commercial timberland statistics.

Table 1.--Area of forest land and percent standard error for the Bear River and Wasatch Front Working Circles, 1977

Item	Softwood types		Hardwood types		All types	
	Percent		Percent		Percent	
	Acres	standard error	Acres	standard error	Acres	standard error
Commercial timberland	98,115	10.9	60,715	18.9	158,830	7.9
Other forest land:						
Unproductive nonreserved	534,576	1.6	455,721	2.8	990,297	1.5

Table 2.--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on commercial timberland, with percent standard error for the Bear River and Wasatch Front Working Circles, 1977

Item	Softwoods		Hardwoods		All species	
	Percent		Percent		Percent	
	Volume	standard error	Volume	standard error	Volume	standard error
Net volume:						
Growing stock (M cubic feet)	176,219	11.9	25,074	23.7	201,293	10.8
Sawtimber (M board feet ¹)	642,064	12.3	13,457	48.8	655,521	12.1
Net annual growth:						
Growing stock (cubic feet)	2,803,836	21.2	1,271,879	30.5	4,075,715	17.8
Sawtimber (board feet ¹)	13,277,412	21.7	426,932	53.0	13,704,344	21.1
Annual mortality:						
Growing stock (cubic feet)	1,283,515	35.4	256,655	50.1	1,540,170	31.1
Sawtimber (board feet ¹)	4,544,500	39.1	56,345	70.7	4,600,845	38.8

¹International 1/4-inch rule.

TERMINOLOGY AND DATA TABLES

The following section contains definitions that are relevant to the timber resource data presented in this resource bulletin. Forest area and timber resource data for the Bear River and Wasatch Front Working Circles, Utah, are displayed in tables 3 through 23.

TERMINOLOGY

Land

Bureau of the Census.--Area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains; streams, sloughs, estuaries, and canals less than 1/8 of a statute mile in width; and lakes, reservoirs, and ponds less than 40 acres in area. Includes noncensus water. See definition below.

Water

Census water.--As defined by the Bureau of the Census, streams, sloughs, estuaries, and canals more than 1/8 of a statute mile in width; and lakes, reservoirs, and ponds more than 40 acres in area.

Noncensus water.--The same as defined by the Bureau of the Census, except minimum width of streams, sloughs, estuaries, and canals is 120 feet and minimum size of lakes, reservoirs, and ponds is 1 acre.

Land Use Classes

Forest land.--Land at least 16.7 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use.

Commercial timberland.--Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization. (Areas qualifying have the capability of producing in excess of 20 cubic feet per acre per year of industrial wood under management. Currently inaccessible and inoperable areas are included, except when the areas involved are small and unlikely to become suitable for production of industrial wood in the foreseeable future.)

Productive-reserved forest land.--Forest land sufficiently productive to qualify as commercial timberland, but withdrawn from timber utilization through statute, administrative designation, or exclusive use for Christmas tree production.

Other forest land.--Forest land incapable of producing 20 cubic feet per acre of industrial wood under management, because of adverse site conditions; includes both reserved and nonreserved forest land.

Nonforest land.--Land that has never supported forests and lands formerly forested where use for timber management is precluded by development for other uses.

Public Ownership Classes

National Forest lands.--Federal lands legally designated as National Forest or purchase units and other lands under the administration of the Forest Service, including experimental areas and Bankhead-Jones Title III lands.

Bureau of Land Management lands.--Federal lands administered by the Bureau of Land Management.

Indian lands.--Tribal lands held in fee by the Federal Government, but administered for Indian tribal groups and Indian trust allotments.

State lands.--Lands owned by States, or lands leased to these governmental units for 50 years or more.

County and municipal lands.--Lands owned by counties and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more.

Private Ownership Classes

Forest industry lands.--Lands owned by companies or individuals operating wood-processing plants.

Farmer-owned lands.--Lands owned by farm operators. (These exclude lands leased by farm operators from such nonfarm owners as railroad companies and States.)

Miscellaneous Federal lands.--Federal lands other than the following: (1) National Forest lands; (2) lands administered by the Bureau of Land Management; and (3) Indian lands.

Other private lands.--Privately owned lands other than forest industry and farmer-owned lands.

Forest Type and Tree Species

Forest types.--A classification of forest land based upon the species forming a plurality of live-tree stocking.

Forest trees.--Woody plants having a well-developed stem and usually more than 12 feet in height at maturity.

Commercial species.--Tree species presently or prospectively suitable for industrial wood products.

Softwoods.--Coniferous trees, usually evergreen, having needles or scalelike leaves.

Hardwoods.--Dicotyledonous trees, usually broad-leaved and deciduous.

Area Condition Classes

Stocking.--Stocking is an effort to express the extent to which growing space is effectively utilized by present or potential growing stock trees of commercial species. "Percent of stocking" is synonymous with "percentage of growing space occupied" and mean ratio of actual stocking to full stocking for comparable sites and stands. Basal area is used as a basis for measuring stocking.

"Stocking percentages" express current area occupancy in relation to specified standards for full stocking based on number, size, and spacing of trees considered necessary to fully utilize the forest land.

Full utilization of the site is assumed to occur over a range of basal area. As an interim guide, 60 percent of the normal yield table values has been used to establish the lower limit of this range which represents full-site occupancy. This is called 100-percent stocking. The upper limit of full stocking has been set at 132 percent. Sites with less than 100-percent stocking represent understocking with less than full-site occupancy. Overstocking is characterized by sites with over 133 percent stocking.

Class 10.--Areas fully stocked (100 to 132 percent) with desirable trees and not overstocked (133 percent or more).

Class 20.--Areas fully stocked with desirable trees, but overstocked with all live trees.

Class 30.--Areas medium to fully stocked (60 to 99 percent) with desirable trees and with less than 30 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

Class 40.--Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees and/or conditions that ordinarily prevent occupancy by desirable trees.

Class 50.--Areas poorly stocked (16.7 to 59 percent) with desirable trees, but fully stocked with growing stock trees.

Class 60.--Areas poorly stocked with desirable trees, but with medium to full stocking of growing stock trees.

Class 70.--Areas nonstocked (less than 16.7 percent) or poorly stocked with desirable trees, and poorly stocked with growing stock trees.

Class 80.--Low-risk old-growth stands.

Class 90.--High-risk old-growth stands.

Nonstocked.--Areas less than 16.7 percent stocked with growing stock trees.

Class of Timber

Growing stock trees.--Live trees of commercial species qualifying as desirable or acceptable trees. (Excludes rough, rotten, and dead trees.)

Desirable trees.--Growing stock trees (a) having no serious defect in quality limiting present or prospective use for timber products; (b) of relatively high vigor; and (c) containing no pathogens that may result in death or serious deterioration before rotation age.

Acceptable trees.--Growing stock trees that meet specified standards of size and quality, but do not qualify as desirable trees.

Rough trees.--(1) Live trees that do not contain at least one 12-foot saw log or two noncontiguous saw logs, each 8 feet long or longer, now or prospectively, and/or do not meet Rocky Mountain Regional specifications for freedom from defect primarily because of roughness or poor form; (2) all live trees of noncommercial species.

Rotten trees.--Live trees that do not contain at least one 12-foot saw log or two noncontiguous saw logs, each 8 feet long or longer, now or prospectively, and/or do not meet Rocky Mountain Regional specifications for freedom from defect primarily because of rot; that is, when more than 50 percent of the cull volume (cubic-foot basis) in a tree is rotten.

Salvable dead trees.--Standing or down dead trees that are considered merchantable by Rocky Mountain Regional standards.

Saw-log portion.--That part of the bole of sawtimber trees between the stump and the saw-log top. A 1-foot stump is used.

Upper-stem portion.--That part of the bole of sawtimber trees above the saw-log top to a minimum top diameter of 4.0 inches outside bark or to the point where the central stem breaks into limbs, whichever occurs first.

Tree Size Classes

Seedlings.--Live trees less than 1.0 inch in diameter at breast height.

Saplings.--Trees 1.0 to 4.9 inches in diameter at breast height.

Poletimber trees.--Trees at least 5.0 inches in d.b.h., but smaller than sawtimber size.

Sawtimber trees.--Trees exceeding poletimber size. In the Intermountain States, the minimum d.b.h. for softwood sawtimber is 9.0 inches and for hardwood, 11.0 inches.

Volume

Cull volume.--Portions of a tree's volume that are not usable for industrial wood products because of rot, form, or other defect.

Net volume.--Gross volume less deductions for cull.

Growing stock volume.--Net volume in cubic feet of live sawtimber trees and live poletimber trees from stump to a minimum 4.0-inch top (of central stem) outside bark. Net volume equals gross volume less deduction for rot and missing bole sections.

Sawtimber volume.--Net volume in board feet of sawtimber trees of commercial species. Net volume equals gross volume less deduction for rot, sweep, crook, and other defects that affect use for lumber.

Growth and Mortality

Net annual growth.--The increase in net growing stock volume of a specified size class for a specific year. (Components of net annual growth include the increment in net volume of trees at the beginning of the specific year surviving to its end, plus net volume of trees reaching the size class during the year, minus the net volume of trees that died during the year, minus the net volume of trees that became rough or rotten trees during the year.)

Mortality.--Number or sound-wood volume of growing stock trees dying from natural causes during a specified period, usually annually.

Site

Site class.--A classification of forest land in terms of inherent capacity to grow crops of industrial wood.

Site classifications are based upon the mean net annual growth of growing stock (not including thinnings or mortality loss) attainable at culmination of mean net annual growth over age. Height-age relationships are usually used as indicators of the specified volume-site class.

Stand-Size Classes

Sawtimber stands.--Stands at least 16.7 percent stocked with growing stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Poletimber stands.--Stands at least 16.7 percent stocked with growing stock trees in which half or more of this stocking is in poletimber and/or sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

Sapling-seedling stands.--Stands at least 16.7 percent stocked with growing stock trees in which more than half of the stocking is saplings and/or seedlings.

Nonstocked land.--Commercial timberland less than 16.7 percent stocked with growing stock trees.

Table 3.--*Total land and water area in the Bear River and Wasatch Front Working Circles by ownership class, 1977*

Ownership class	Acres	Hectares
National Forest	786,167	318,152
Bureau of Land Management	3,173,581	1,284,308
Indian	19,132	7,742
Miscellaneous Federal	68,376	27,671
State	569,773	230,580
County and municipal	26,584	10,758
Private	6,216,419	2,515,706
Total land area	10,860,032	4,394,917
Census water	1,295,360	524,216
Gross area ¹	12,155,392	4,919,133

¹U.S. Bureau of the Census, land and water area of the United States, 1970.

Table 4.--*Total land area in the Bear River and Wasatch Front Working Circles by major land class and ownership class, 1977*

Land class	Ownership class			
	Public		Private	
	Acres	Hectares	Acres	Hectares
Commercial timberland	32,684	13,227	126,146	51,049
Productive reserved	0	0	0	0
Other forest land:				
Unproductive reserved	13,208	5,345	0	0
Unproductive nonreserved	398,488	161,263	591,809	239,498
Total forest land	444,380	179,835	717,955	290,547
Nonforest land	3,413,066	1,381,224	5,498,464	2,225,159
Total land area	3,857,446	1,561,059	6,216,419	2,515,706

Table 5.--Area of commercial timberland in the Bear River and Wasatch Front Working Circles by forest type, stand-size class, and site class, 1977

Forest type and stand-size class	Site class				All classes
	120+	85-119	50-84	20-49	
- - - - - Acres - - - - -					
Douglas-fir:					
Sawtimber	--	2,779	16,799	17,183	36,761
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	2,755	--	--	2,755
Total	--	5,534	16,799	17,183	39,516
Fir-spruce:					
Sawtimber	--	8,128	30,608	11,314	50,050
Poletimber	--	--	--	2,878	2,878
Sapling and seedling	--	--	2,892	--	2,892
Nonstocked	--	--	--	--	--
Total	--	8,128	33,500	14,192	55,820
Lodgepole pine:					
Sawtimber	--	--	--	2,779	2,779
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	--	2,779	2,779
Aspen:					
Sawtimber	--	--	5,602	--	5,602
Poletimber	--	--	16,779	11,078	27,857
Sapling and seedling	--	--	8,118	13,775	21,893
Nonstocked	--	--	--	--	--
Total	--	--	30,499	24,853	55,352
Cottonwood:					
Sawtimber	--	--	--	5,363	5,363
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	--	5,363	5,363
All types:					
Sawtimber	--	10,907	53,009	36,639	100,555
Poletimber	--	--	16,779	13,956	30,735
Sapling and seedling	--	--	11,010	13,775	24,785
Nonstocked	--	2,755	--	-	2,755
Total	--	13,662	80,798	64,370	158,830

Table 6.--Area of publicly owned commercial timberland in the Bear River and Wasatch Front Working Circles by forest type, stand-size class, and site class, 1977

Forest type and stand-size class	:	Site class				:	All			
	:	120+	:	85-119	:	50-84	:	20-49	:	classes
- - - - - Acres - - - - -										
Douglas-fir:										
Sawtimber	--		747		3,911		4,085		8,743	
Poletimber	--		--		--		--		--	
Sapling and seedling	--		--		--		--		--	
Nonstocked	--		545		--		--		545	
Total	--		1,292		3,911		4,085		9,288	
Fir-spruce:										
Sawtimber	--		1,886		7,513		3,026		12,425	
Poletimber	--		--		--		765		765	
Sapling and seedling	--		--		276		--		276	
Nonstocked	--		--		--		--		--	
Total	--		1,886		7,789		3,791		13,466	
Lodgepole pine:										
Sawtimber	--		--		--		747		747	
Poletimber	--		--		--		--		--	
Sapling and seedling	--		--		--		--		--	
Nonstocked	--		--		--		--		--	
Total	--		--		--		747		747	
Aspen:										
Sawtimber	--		--		1,064		--		1,064	
Poletimber	--		--		2,325		1,243		3,568	
Sapling and seedling	--		--		1,194		2,707		3,901	
Nonstocked	--		--		--		--		--	
Total	--		--		4,583		3,950		8,533	
Cottonwood:										
Sawtimber	--		--		--		650		650	
Poletimber	--		--		--		--		--	
Sapling and seedling	--		--		--		--		--	
Nonstocked	--		--		--		--		--	
Total	--		--		--		650		650	
All types:										
Sawtimber	--		2,633		12,488		8,508		23,629	
Poletimber	--		--		2,325		2,008		4,333	
Sapling and seedling	--		--		1,470		2,707		4,177	
Nonstocked	--		545		--		--		545	
Total	--		3,178		16,283		13,223		32,684	

Table 7.--Area of privately owned commercial timberland in the Bear River and Wasatch Front Working Circles by forest type, stand-size class, and site class, 1977

Forest type and stand-size class	Site class				All classes
	120+	85-119	50-84	20-49	
- - - - - Acres - - - - -					
Douglas-fir:					
Sawtimber	--	2,032	12,888	13,098	28,018
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	2,210	--	--	2,210
Total	--	4,242	12,888	13,098	30,228
Fir-spruce:					
Sawtimber	--	6,242	23,095	8,288	37,625
Poletimber	--	--	--	2,113	2,113
Sapling and seedling	--	--	2,616	--	2,616
Nonstocked	--	--	--	--	--
Total	--	6,242	25,711	10,401	42,354
Lodgepole pine:					
Sawtimber	--	--	--	2,032	2,032
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	--	2,032	2,032
Aspen:					
Sawtimber	--	--	4,538	--	4,538
Poletimber	--	--	14,454	9,835	24,289
Sapling and seedling	--	--	6,924	11,068	17,992
Nonstocked	--	--	--	--	--
Total	--	--	25,916	20,903	46,819
Cottonwood:					
Sawtimber	--	--	--	4,713	4,713
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	--	4,713	4,713
All types:					
Sawtimber	--	8,274	40,521	28,131	76,926
Poletimber	--	--	14,454	11,948	26,402
Sapling and seedling	--	--	9,540	11,068	20,608
Nonstocked	--	2,210	--	--	2,210
Total	--	10,484	64,515	51,147	126,146

Table 8.--Area of commercial timberland in the Bear River and Wasatch Front Working Circles by stand volume and ownership class, 1977

Stand volume per acre ¹	Ownership class		
	Public	Private	Public and private
	Acres		
Less than 1,500 board feet	9,317	49,013	58,330
1,500 to 4,999 board feet	8,972	33,104	42,076
5,000 board feet or more	14,395	44,029	58,424
All classes	32,684	126,146	158,830

¹International 1/4-inch rule.

Table 9.--Area of commercial timberland in the Bear River and Wasatch Front Working Circles by forest type and area condition class, 1977

Forest type	Area condition class										Nonstocked	All classes
	10	20	30	40	50	60	70	80	90	90		
	Acres											
Douglas-fir	--	--	--	--	--	8,549	11,413	8,511	8,288	2,755	39,516	15,992
Fir-spruce	2,779	--	--	7,721	2,878	17,084	5,756	8,387	11,215	--	55,820	22,589
Lodgepole pine	--	--	--	--	--	2,779	--	--	--	--	2,779	1,125
Aspen	--	4,942	--	24,740	11,362	5,770	8,538	--	--	--	55,352	22,400
Cottonwood	--	--	--	--	--	--	5,363	--	--	--	5,363	2,170
All types	2,779	4,942	--	32,461	14,240	34,182	31,070	16,898	19,503	2,755	158,830	64,276

Table 10.--Area of productive reserved and other forest land in the Bear River and Wasatch Front Working Circles by land class, ownership class, and forest type, 1977

Land class	Forest type						All types
	Douglas-fir	Limber pine	Fir-spruce	Pinyon-juniper	Aspen	Mixed hardwoods	
Productive reserved area:							
Public	--	--	--	--	--	--	--
Private	0	0	0	0	0	0	0
Other forest land area:							
Unproductive nonreserved:							
Public	544	765	766	319,750	7,516	69,147	398,488
Private	2,210	2,112	2,112	206,317	56,821	322,237	591,809
Unproductive reserved:							
Public	--	--	--	13,208	--	--	13,208
Private	0	0	0	0	0	0	0
All areas:							
Public	544	765	766	332,958	7,516	69,147	411,696
Private	2,210	2,112	2,112	206,317	56,821	322,237	591,809
Total acres	2,754	2,877	2,878	539,275	64,337	391,384	1,003,505
Total hectares	1,115	1,164	1,165	218,238	26,036	158,388	406,106

Table 11.--Number of growing stock trees on commercial timberland in the Bear River and Wasatch Front Working Circles by species and diameter class, 1977

Species	Diameter class (inches at breast height)																All classes
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0-30.0+		
Thousand trees																	
Douglas-fir	594	754	520	889	615	518	294	270	156	87	84	61	24	3	38	4,907	
Lodgepole pine	--	--	--	26	--	30	24	18	--	20	--	--	--	--	--	118	
Limber pine	83	--	--	--	56	55	31	8	38	15	9	11	6	3	--	315	
Subalpine fir	2,086	1,946	2,055	1,108	658	495	213	191	154	62	38	22	12	10	4	9,054	
White fir	1,194	592	739	544	295	127	144	79	99	27	41	14	9	3	7	3,914	
Engelmann spruce	--	165	267	186	163	72	74	34	39	27	13	11	6	2	4	1,063	
Pinyon/juniper	--	--	--	--	26	--	--	--	--	--	--	--	--	--	--	26	
Total softwoods	3,957	3,457	3,581	2,753	1,813	1,297	780	600	486	238	185	119	57	21	53	19,397	
Aspen	13,098	6,113	5,089	2,185	917	144	75	16	--	--	--	--	--	--	--	27,637	
Cottonwood	--	74	--	24	71	39	30	17	--	9	4	--	--	--	--	268	
Total hardwoods	13,098	6,187	5,089	2,209	988	183	105	33	--	9	4	--	--	--	--	27,905	
All species	17,055	9,644	8,670	4,962	2,801	1,480	885	633	486	247	189	119	57	21	53	47,302	

Table 12.--Number of cull and salvageable dead trees on commercial timberland in the Bear River and Wasatch Front Working Circles by ownership class, and softwoods and hardwoods, 1977

Ownership class and species group	Sound		Cull trees		Salvageable	
	Thousand trees		Rotten	Total	dead trees	
Public:						
Softwoods	533		133	666	143	
Hardwoods	296		179	475	134	
Total	829		312	1,141	277	
Private:						
Softwoods	1,671		443	2,114	447	
Hardwoods	1,329		990	2,319	786	
Total	3,000		1,433	4,433	1,233	
Public and private:						
Softwoods	2,204		576	2,780	590	
Hardwoods	1,625		1,169	2,794	920	
Total	3,829		1,745	5,574	1,510	

Table 13.--Net volume of growing stock on commercial timberland in the Bear River and Wasatch Front Working Circles by ownership class, forest type, and stand-size class, 1977

Ownership class:	Forest type	Stand-size class				All classes		
		Sawtimber	Poletimber	Sapling/seedling	Nonstocked			
Public:		-	-	-	-	-	-	Thousand cubic meters
	Douglas-fir	14,249	--	--	151	14,400	407	
	Fir-spruce	24,924	455	99	--	25,478	722	
	Lodgepole pine	755	--	--	--	755	22	
	Aspen	1,176	2,406	1,214	--	4,796	136	
	Cottonwood	296	--	--	--	296	8	
	All types	41,400	2,861	1,313	151	45,725	1,295	
Private:		45,700	--	--	613	46,313	1,312	
	Douglas-fir	76,567	1,254	943	--	78,764	2,230	
	Fir-spruce	2,054	--	--	--	2,054	58	
	Lodgepole pine	3,849	16,386	5,978	--	26,213	742	
	Aspen	2,224	--	--	--	2,224	63	
	Cottonwood							
	All types	130,394	17,640	6,921	613	155,568	4,405	
Public and private:		59,949	--	--	764	60,713	1,719	
	Douglas-fir	101,491	1,709	1,042	--	104,242	2,952	
	Fir-spruce	2,809	--	--	--	2,809	80	
	Lodgepole pine	5,025	18,792	7,192	--	31,009	878	
	Aspen	2,520	--	--	--	2,520	71	
	Cottonwood							
	All types	171,794	20,501	8,234	764	201,293	5,700	

Table 14.--Net volume of sawtimber on commercial timberland in the Bear River and Wasatch Front Working Circles by ownership class, forest type, and stand-size class, 1977

Ownership class:	Forest type	Stand-size class				All classes					
		Sawtimber	Poletimber	Sapling/seedling	Nonstocked						
Public:		-	-	-	-	<i>Thousand board feet</i> ¹	-	-	-	-	-
	Douglas-fir	52,936	--	--	--		90				53,026
	Fir-spruce	90,611	997	136	--		--				91,744
	Lodgepole pine	2,980	--	--	--		--				2,980
	Aspen	2,233	2,079	2,183	--		--				6,495
	Cottonwood	1,106	--	--	--		--				1,106
	All types	149,866	3,076	2,319		90					155,351
Private:		170,696	--	--	--		367				171,063
	Douglas-fir	275,072	2,752	1,287	--		--				279,111
	Fir-spruce	8,103	--	--	--		--				8,103
	Lodgepole pine	7,776	15,375	10,675	--		--				33,826
	Aspen	8,067	--	--	--		--				8,067
	Cottonwood										
	All types	469,714	18,127	11,962		367					500,170
Public and private:		223,632	--	--	--		457				224,089
	Douglas-fir	365,683	3,749	1,423	--		--				370,855
	Fir-spruce	11,083	--	--	--		--				11,083
	Lodgepole pine	10,009	17,454	12,858	--		--				40,321
	Aspen	9,173	--	--	--		--				9,173
	Cottonwood										
	All types	619,580	21,203	14,281		457					655,521

¹International 1/4-inch rule.

Table 15.--Net volume of growing stock on commercial timberland in the Bear River and Wasatch Front
Working Circles by species and diameter class, 1977

Species	Diameter class (inches at breast height)																All classes
	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 22.9	23.0- 24.9	25.0- 26.9	27.0- 28.9	29.0- 30.9	31.0- 32.9	33.0- 34.9	35.0- 36.9	
Thousand cubic feet																	
Douglas-fir	1,028	4,797	6,920	8,585	7,021	8,637	6,245	4,612	6,635	5,263	2,595	197	6,718				69,253
Lodgepole pine	--	177	--	392	410	453	--	1,044	--	--	--	--	--	--	--	--	2,476
Limber pine	--	--	652	842	849	195	1,294	708	382	828	528	322	--	--	--	--	6,600
Subalpine fir	4,311	6,197	6,602	7,712	5,355	6,603	6,258	3,450	2,671	1,850	931	1,151	497	53,588			53,588
White fir	6,216	5,378	3,581	2,022	3,162	2,006	3,356	1,027	1,935	725	487	208	740	30,843			30,843
Engelmann spruce	623	795	1,560	1,162	1,653	1,081	1,410	1,526	763	1,050	797	349	688	13,457			13,457
Pinyon/juniper	--	--	2	--	--	--	--	--	--	--	--	--	--	--	--	--	2
Total softwoods	12,178	17,344	19,317	20,715	18,450	18,975	18,563	12,367	12,386	9,716	5,338	2,227	8,643				176,219
Aspen	7,201	6,821	5,507	1,417	1,048	309	--	--	--	--	--	--	--	--	--	--	22,303
Cottonwood	--	153	515	549	540	468	--	422	124	--	--	--	--	--	--	--	2,771
Total hardwoods	7,201	6,974	6,022	1,966	1,588	777	--	422	124	--	--	--	--	--	--	--	25,074
All species	19,379	24,318	25,339	22,681	20,038	19,752	18,563	12,789	12,510	9,716	5,338	2,227	8,643				201,293

Table 16.--Net volume of sawtimber on commercial timberland in the Bear River and Wasatch Front
Working Circles by species and diameter class, 1977

Species	Diameter class (inches at breast height)																All classes
	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 22.9	23.0- 24.9	25.0- 26.9	27.0- 28.9	29.0- 30.9	31.0- 32.9	33.0- 34.9	35.0- 36.9	37.0- 38.9	39.0- 40.9	
	Thousand board feet, International 1/4-inch rule																
Douglas-fir	26,862	35,404	30,552	39,189	29,220	22,204	32,753	26,404	13,222	1,017	35,621						292,448
Lodgepole pine	--	1,732	1,880	2,162	--	5,309	--	--	--	--	--	--	--	--	--	--	11,083
Limber pine	2,687	3,766	3,930	950	6,441	3,605	1,998	4,311	2,802	1,705	--	--	--	--	--	--	32,195
Subalpine fir	23,685	29,604	21,788	27,944	27,183	15,387	12,137	8,508	4,363	5,450	2,387	178,436					178,436
White fir	8,079	6,633	12,871	8,464	14,869	4,500	8,333	3,089	2,071	914	3,381	73,204					73,204
Engelmann spruce	5,892	4,727	7,143	4,827	6,604	7,239	3,749	5,184	3,967	1,773	3,587	54,692					54,692
Pinyon/juniper	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6
Total softwoods	67,211	81,866	78,164	83,536	84,317	58,244	58,970	47,496	26,425	10,859	44,976						642,064
Aspen	XXXX	1,531	1,196	366	--	--	--	--	--	--	--	3,093					
Cottonwood	XXXX	2,799	2,711	2,321	--	1,972	561	--	--	--	--	10,364					
Total hardwoods	XXXX	4,330	3,907	2,687	--	1,972	561	--	--	--	--	13,457					
All species	67,211	86,196	82,071	86,223	84,317	60,216	59,531	47,496	26,425	10,859	44,976						655,521

Table 17.--Net volume of growing stock and sawtimber on commercial timberland in the Bear River and Wasatch Front Working Circles by ownership class and species, 1977

Ownership class:	Species									
	Douglas-fir:	Lodgepole:	Limber:	Subalpine:	White fir:	Engelmann:	Pinyon/	Total:	Aspen:	Cottonwood:
	pine:	pine:	pine:	fir:	fir:	spruce:	juniper:	softwoods:	hardwoods:	Total:
GROWING STOCK										
Thousand cubic feet										
Public	16,232	666	1,634	13,436	6,942	3,017	(¹)	41,927	3,464	334
Private	53,021	1,810	4,966	40,152	23,901	10,440	2	134,292	18,839	2,437
Total	69,253	2,476	6,600	53,588	30,843	13,457	2	176,219	22,303	2,771
GROWING STOCK										
Thousand cubic meters										
Public	460	19	46	380	197	85	(²)	1,187	98	10
Private	1,501	51	141	1,137	677	296	(²)	3,803	533	69
Total	1,961	70	187	1,517	874	381	(²)	4,990	631	79
SAWTIMBER										
Thousand board feet, International 1/4-inch rule										
Public	69,041	2,980	8,035	44,941	16,318	12,268	1	153,584	481	1,286
Private	223,407	8,103	24,160	133,495	56,886	42,424	5	488,480	2,612	9,078
Total	292,448	11,083	32,195	178,436	73,204	54,692	6	642,064	3,093	10,364
										13,457
										655,521

¹Less than 0.5 thousand cubic feet.

²Less than 0.5 thousand cubic meters.

Table 18.--Net volume of timber on commercial timberland in the Bear River and Wasatch Front Working Circles by class of timber, and softwoods and hardwoods, 1977

Class of timber	Softwoods	Hardwoods	All classes
Sawtimber trees:			
----- Thousand cubic feet -----			
Saw-log portion	138,963	4,142	143,105
Upper-stem portion	7,734	735	8,469
Total	146,697	4,877	151,574
Poletimber trees	29,522	20,197	49,719
All growing stock trees	176,219	25,074	201,293
Sound cull trees	3,873	250	4,123
Rotten cull trees	507	932	1,439
Salvable dead trees	5,087	3,647	8,734
All timber	185,686	29,903	215,589

Table 19.--Net volume of growing stock on commercial timberland in the Bear River and Wasatch Front Working Circles by forest type and species, 1977

Forest type	Species									
	Douglas-fir	Lodgepole pine	limber pine	Subalpine fir	White fir	Engelmann spruce	Pinyon juniper	Aspen softwoods	Cottonwood	All species
----- Thousand cubic feet -----										
Douglas-fir	51,561	--	--	933	7,090	--	--	59,584	1,129	60,713
Fir-spruce	14,556	--	6,600	48,595	17,915	13,232	--	100,898	3,344	104,242
Lodgepole pine	--	2,476	--	--	--	--	--	2,476	333	2,809
Aspen	3,136	--	--	4,060	5,838	225	2	13,261	17,748	31,009
Cottonwood	--	--	--	--	--	--	--	--	2,520	2,520
All types	69,253	2,476	6,600	53,588	30,843	13,457	2	176,219	22,303	201,293
----- Thousand cubic meters -----										
All types	1,961	70	187	1,517	874	381	(¹)	4,990	631	5,700

¹Less than 0.5 thousand cubic meters.

Table 22.--Annual mortality of growing stock and sawtimber on commercial timberland in the Bear River and Wasatch Front Working Circles by ownership class, and softwoods and hardwoods, 1977

Species group and ownership class :	Growing stock :	Sawtimber :
- <i>Cubic feet</i> -	- <i>Cubic meters</i> -	- <i>Board feet</i> ¹ -
Public	277,877	7,869
Private	1,005,638	28,476
Total	1,283,515	36,345
Hardwoods:		
Public	37,419	1,060
Private	219,236	6,208
Total	256,655	7,268
		56,345

¹International 1/4-inch rule.

Table 23.--Annual mortality of growing stock and sawtimber on commercial timberland in the Bear River and Wasatch Front Working Circles by cause of death and species, 1977

Cause of death	Species					All species		
	Douglas-fir	Subalpine fir	White fir	Total softwoods	Aspen			
GROWING STOCK								
			Cubic feet					
Insects	--	260,124	168,555	428,679	--		428,679	
Disease	--	--	--	--	103,342		103,342	
Fire	140,634	--	--	140,634	--		140,634	
Weather	8,099	--	57,667	65,766	--		65,766	
Suppression	--	--	113,881	113,881	--		113,881	
Unknown	112,968	348,085	73,502	534,555	153,313		687,868	
Total	261,701	608,209	413,605	1,283,515	256,655		1,540,170	
GROWING STOCK								
			Cubic meters					
Insects	--	7,366	4,773	12,139	--		12,139	
Disease	--	--	--	--	2,926		2,926	
Fire	3,982	--	--	3,982	--		3,982	
Weather	229	--	1,633	1,862	--		1,862	
Suppression	--	--	3,225	3,225	--		3,225	
Unknown	3,199	9,857	2,081	15,137	4,342		19,479	
Total	7,410	17,223	11,712	36,345	7,268		43,613	
SAWTIMBER								
			Board feet, International 1/4-inch rule					
Insects	--	1,125,688	739,230	1,864,918	--		1,864,918	
Disease	--	--	--	--	28,492		28,492	
Fire	628,582	--	--	628,582	--		628,582	
Weather	--	--	158,826	158,826	--		158,826	
Suppression	--	--	152,895	152,895	--		152,895	
Unknown	509,486	905,756	324,037	1,739,279	27,853		1,767,132	
Total	1,138,068	2,031,444	1,374,988	4,544,500	56,345		4,600,845	

1971		1972		1973		1974		1975		1976		1977		1978		1979		1980		1981		1982		1983		1984		1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996		1997		1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		2020		2021		2022		2023		2024		2025		2026		2027		2028		2029		2030		2031		2032		2033		2034		2035		2036		2037		2038		2039		2040		2041		2042		2043		2044		2045		2046		2047		2048		2049		2050		2051		2052		2053		2054		2055		2056		2057		2058		2059		2060		2061		2062		2063		2064		2065		2066		2067		2068		2069		2070		2071		2072		2073		2074		2075		2076		2077		2078		2079		2080		2081		2082		2083		2084		2085		2086		2087		2088		2089		2090		2091		2092		2093		2094		2095		2096		2097		2098		2099		2100		2101		2102		2103		2104		2105		2106		2107		2108		2109		2110		2111		2112		2113		2114		2115		2116		2117		2118		2119		2120		2121		2122		2123		2124		2125		2126		2127		2128		2129		2130		2131		2132		2133		2134		2135		2136		2137		2138		2139		2140		2141		2142		2143		2144		2145		2146		2147		2148		2149		2150		2151		2152		2153		2154		2155		2156		2157		2158		2159		2160		2161		2162		2163		2164		2165		2166		2167		2168		2169		2170		2171		2172		2173		2174		2175		2176		2177		2178		2179		2180		2181		2182		2183		2184		2185		2186		2187		2188		2189		2190		2191		2192		2193		2194		2195		2196		2197		2198		2199		2200		2201		2202		2203		2204		2205		2206		2207		2208		2209		2210		2211		2212		2213		2214		2215		2216		2217		2218		2219		2220		2221		2222		2223		2224		2225		2226		2227		2228		2229		2230		2231		2232		2233		2234		2235		2236		2237		2238		2239		2240		2241		2242		2243		2244		2245		2246		2247		2248		2249		2250		2251		2252		2253		2254		2255		2256		2257		2258		2259		2260		2261		2262		2263		2264		2265		2266		2267		2268		2269		2270		2271		2272		2273		2274		2275		2276		2277		2278		2279		2280		2281		2282		2283		2284		2285		2286		2287		2288		2289		2290		2291		2292		2293		2294		2295		2296		2297		2298		2299		2300		2301		2302		2303		2304		2305		2306		2307		2308		2309		2310		2311		2312		2313		2314		2315		2316		2317		2318		2319		2320		2321		2322		2323		2324		2325		2326		2327		2328		2329		2330		2331		2332		2333		2334		2335		2336		2337		2338		2339		2340		2341		2342		2343		2344		2345		2346		2347		2348		2349		2350		2351		2352		2353		2354		2355		2356		2357		2358		2359		2360		2361		2362		2363		2364		2365		2366		2367		2368		2369		2370		2371		2372		2373		2374		2375		2376		2377		2378		2379		2380		2381		2382		2383		2384		2385		2386		2387		2388		2389		2390		2391		2392		2393		2394		2395		2396		2397		2398		2399		2400		2401		2402		2403		2404		2405		2406		2407		2408		2409		2410		2411		2412		2413		2414		2415		2416		2417		2418		2419		2420		2421		2422		2423		2424		2425		2426		2427		2428		2429		2430		2431		2432		2433		2434		2435		2436		2437		2438		2439		2440		2441		2442		2443		2444		2445		2446		2447		2448		2449		2450		2451		2452		2453		2454		2455		2456		2457		2458		2459		2460		2461		2462		2463		2464		2465		2466		2467		2468		2469		2470		2471		2472		2473		2474		2475		2476		2477		2478		2479		2480		2481		2482		2483		2484		2485		2486		2487		2488		2489		2490		2491		2492		2493		2494		2495		2496		2497		2498		2499		2500		2501		2502		2503		2504		2505		2506		2507		2508		2509		2510		2511		2512		2513		2514		2515		2516		2517		2518		2519		2520		2521		2522		2523		2524		2525		2526		2527		2528		2529		2530		2531		2532		2533		2534		2535		2536		2537		2538		2539		2540		2541		2542		2543		2544		2545		2546		2547		2548		2549		2550		2551		2552		2553		2554		2555		2556		2557		2558		2559		2560		2561		2562		2563		2564		2565		2566		2567		2568		2569		2570		2571		2572		2573		2574		2575		2576		2577		2578		2579		2580		2581		2582		2583		2584		2585		2586		2587		2588		2589		2590		2591		2592		2593		2594		2595		2596		2597		2598		2599		2600		2601		2602		2603		2604		2605		2606		2607		2608		2609		2610		2611		2612		2613		2614		2615		2616		2617		2618		2619		2620		2621		2622		2623		2624		2625		2626		2627		2628		2629		2630		2631		2632		2633		2634		2635		2636		2637		2638		2639		2640		2641		2642		2643		2644		2645		2646		2647		2648		2649		2650		2651		2652		2653		2654		2655		2656		2657		2658		2659		2660		2661		2662		2663		2664		2665		2666		2667		2668		2669		2670		2671		2672		2673		2674		2675		2676		2677		2678		2679		2680		2681		2682		2683		2684		2685		2686		2687		2688		2689		2690		2691		2692		2693		2694		2695		2696		2697		2698		2699		2700		2701		2702		2703		2704		2705		2706		2707		2708		2709		2710		2711		2712		2713		2714		2715		2716		2717		2718		2719		2720		2721		2722		2723		2724		2725		2726		2727		2728		2729		2730		2731		2732		2733		2734		2735		2736		2737		2738		2739		2740		2741		2742		2743		2744		2745		2746		2747		2748		2749		2750		2751		2752		2753		2754		2755		2756		2757		2758		2759		2760		2761		2762		2763		2764		2765		2766		2767		2768		2769		2770		2771		2772		2773		2774		2775		2776		2777		2778		2779		2780		2781		2782		2783		2784		2785		2786		2787		2788		2789		2790		2791		2792		2793		2794		2795		2796		2797		2798		2799		2800		2801		2802		2803		28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Felt, Dorothy G.

1980. Forest area and timber resource statistics for the Bear River and Wasatch Front Working Circles, Utah, 1976-1977. USDA For. Serv. Resour. Bull. INT-22, 25 p. Intermt. For. and Ranger Exp. Stn., Ogden, Utah 84401.

Presents land area, commercial timberland area, timber inventory, and growth and mortality data based on Resources Evaluation standards.

KEYWORDS: forest surveys (regional), forest area classification, stand volume

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The Intermountain Station, headquartered in Ogden, Utah, is one of eight regional experiment stations charged with providing scientific knowledge to help resource managers meet human needs and protect forest and range ecosystems.

The Intermountain Station includes the States of Montana, Idaho, Utah, Nevada, and western Wyoming. About 231 million acres, or 85 percent, of the land area in the Station territory are classified as forest and rangeland. These lands include grasslands, deserts, shrublands, alpine areas, and well-stocked forests. They supply fiber for forest industries; minerals for energy and industrial development; and water for domestic and industrial consumption. They also provide recreation opportunities for millions of visitors each year.

Field programs and research work units of the Station are maintained in:

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Bozeman, Montana (in cooperation with Montana State University)

Logan, Utah (in cooperation with Utah State University)

Missoula, Montana (in cooperation with the University of Montana)

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Provo, Utah (in cooperation with Brigham Young University)

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